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In case the flower has not been visited by a Megachile the Halictus goes to the mouth of the corolla and enters in the usual way; but it usually alights on the base first and hunts for the artificial opening.

Mt. Carmel, Ill. J. SCHENCK.

An acknowledgment.

In the correcting of the proof of the paper on the ostrich fern, noticed in the GAZETTE for December, a paragraph stating under what conditions the investigations were made was inadvertently omitted. The work was done under the supervision of Professor V. M. Spalding, of the University of Michigan, to whom the author begs to offer this somewhat tardy expression of his thanks for the valuable assistance and encouragement received from him during the pursuance of the work.

Berlin, Germany. DOUGLAS H. CAMPBELL.

CURRENT LITERATURE.

Flowers and fruit of Sparganium and Typha.[1]

In this monograph Dr. Dietz has given the results of a comparative study of the development of the floral and fruit structures of Sparganium and Typha. It is a good model of those studies which are necessary before botanists can speak with any definiteness upon the relationships of plants; studies which should be greatly multiplied, and which furnish a vast and useful field of labor for our ever increasing army of botanists. Taking a group of doubtful relationships, the author has laid the foundation for a rational discussion of the subject, which he promises at some subsequent time. The vegetative structures are mostly alike, but the reproductive organs show notable differences. A radical difference occurs in the positions of the flowers themselves, those of Sparganium occurring upon secondary and tertiary axes, while those of Typha are upon primary and secondary axes. Every detail in the development of the floral parts is described and figured with that minuteness that seems to leave none of the anatomical details unrecorded. The greatest differences are found in the structures of the pistil, the most apparent of which is its bicarpellary character in Sparganium, and monocarpellary character in Typha. The formation of the integuments of the seed also differs widely. In conclusion, the author considers that, while there are enough characters in common to justify retaining these two genera in one order for the present, the differences are sufficient to indicate that there may be ordinal characters. This structural study shows that Sparganium is nearest to the Pandaneæ, while Typha shows relationships to the Aroideæ.

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[1] DIETZ, DR. SANDOR.—Ueber die Entwickelung der Blüthe und Frucht von Sparganium Tourn. und Typha Tourn. (Bibliotheca botanica, heft 5.) 60 pp., 3 plates. 4to. Cassel: Theodor Fischer, 1887.—8 marks.

Lessons in botany.[2]

Dr. Gray has been preëminently the teacher of botany in this country for half a century; not only in marshaling our hosts of North American plants into an orderly array, but, also, in imparting, by means of his text-books, the general principles of the science. No text-book has been more widely used than the one of which this is a revision; and nothing could be more appropriate than for the author himself to give a final revision, which has been long demanded by our rapid advance in knowledge. There can be no doubt that this is the best book for its purpose that we now have. Choosing for a title that of his first text book, published over fifty years ago, the author presents, in that clear and simple style of which he is so great a master, the elements of botany which he considers are essential for beginners to know. In the preface he wisely calls attention to the fact that even this book should be considered more of a reference book than anything else, and that its technical names mean nothing unless applied. In fact, its legitimate use seems to be that of an extended and illustrated glossary, to be elaborated by the teacher and applied in the laboratory. If so useful a book is to be criticised, we would say that, although it is a vast improvement upon the edition it is meant to replace, there might have been some additional improvements that even conservatism will allow to the "cryptogamically-minded." The perpetuation of the word "nucleus" to express what we now understand by "nucellus" is a case in point, and must lead to a confusion of terms that is not helpful, to say the least. Many of the figures have served their day and generation, and might well have been replaced by others, not because the latter would have looked better, but because they would have represented facts (*e. g.*, those representing the anatomical elements of the fibro-vascular system, pp. 133-135). The figure of Oscillaria, p. 149, could surely have been bettered. On page 101, fig. 295 still conveys its old impression that pollen sacs are made by rolling up the leaf edges, an impression which a sentence added to the foot-note would have corrected. A remarkable slip is found on p. 104, where it is said that the pollen of pine "consists of three cells, of which the middle one is large, wholly empty, and light." Undoubtedly, the use of old figures is largely to be ascribed to the publishers. Although more concession to the results of modern botanical work might have been expected, the author may have been wisely conservative, and his justly great name insures a book that can be trusted.

Poisonous plants.

At the time the editorial was written which appeared in this journal a few months since on plants considered harmless by most persons, but thought to be poisonous by some, it was not known to the editors that a book covering about the ground there suggested had just been issued.

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[2] GRAY, ASA.—The elements of botany, for beginners and for schools. (Lessons in botany, revised edition.) 226 pp., 589 figs., small 8vo. New York and Chicago: Ivison, Blakeman & Co., 1887.—$1.00.

The work[3] has since been sent for review, and can be commended as a carefully prepared account of the action of irritants upon the skin, especially those directly due to or derived from plants—such plants being generally spoken of as poisonous. Dr. White, the author, is professor of dermatology in Harvard University, and speaks with authority about the forms and degrees of inflammation and the subsequent development of the affection caused by each plant of which he writes. He has also called to his assistance a number of eminent authorities in botany, zoölogy, etc.

About fifty pages of the work are occupied with an account of irritants other than vegetable, but it is of the latter only that we shall now speak. Eighty-six genera of plants, mostly found in the United States, with one or more species each, are put into the list of "poisonous." The virulent kinds of Rhus naturally take the lead, and the series shades off into such apparently innocent but quasi-harmful plants as the delicate wind-flower, the earliest of the Anemones.

Forty pages are devoted to rhus poisoning—too much to be even summarized in this place. We turn with interest to the treatment of its etiology, and are somewhat disappointed to find that the latest reference is to work done in 1865. At that time Prof. Maisch, of Philadelphia, decided that the poisonous properties reside in a volatile acid which he called toxicodendric acid. No reference is made to Dr. Burrill's statement that the action is due to microbes, which he described and named. The bacterial theory has received some credence, even from careful medical writers (*e. g.*, Dr. Gradle in "Germ Theory of Disease," 1883), and a description of the microbe is included in systematic works (*e. g.*, Grove's ' Bacteria and Yeast Fungi," 1884), so that some notice of it would have been in place.

Many of the plants put into the indicated list, one might possibly say the majority, are usually looked upon as harmless, and the reader is treated to a succession of surprises quite as disagreeable in their way as if he were to discover that his respected, although it may be humble, acquaintances were being accused of petty misdemeanors. Thus, the list includes, to cite at random, arnica, beggar-ticks, fleabane, burdock, ox-eye daisy, mayweed, golden-rod and cocklebur. The way in which the poisonous effects are produced are as diverse as the plants which produce them. In some cases successful remedial agents are known.

As this is the first book of the kind, there is necessarily much omitted; for instance, no mention is made of the strong vesicating action of the juice of Euphorbia marginata, a fact well known to most persons who have had the plant in their gardens. The experience of nearly every one will probably suggest some items of additional information, and the author will doubtless be pleased to receive data of authentic nature from users of the work.

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[3] WHITE, DR. JAMES C.—Dermatitis Venenata, an account of the action of external irritants upon the skin. 216 pp., 8vo. Boston: Cupples & Hurd, 1887.

A monograph on Stigmaria.[4]

Professor Williamson has done more, probably, than any other individual towards perfecting our knowledge of the structure and affinities of the plants of the coal-measures. Entering the field of palæontological science in 1833 as a contributor to the "Fossil Flora of Great Britain," by Lindley & Hutton, almost every year since has witnessed the production from his pen of papers of more or less extent, describing in detail the histology and relationships of carboniferous plants. The last is the elaborate and beautiful memoir before us.

Stigmaria ficoides is one of the most abundant and well-known plants of the carboniferous age. It is most frequently met with, however, in the form of inorganic casts of the scarred exterior or of the fistular medullary interior. As these casts were the only conditions under which it was known for a long time, the histology, and consequently the affinities, long remained in question. During the last half century, however, specimens have been obtained from various localities in which the structure has been more or less clearly preserved, and through a study of these considerable light has been thrown upon the affinities of these curious plants.

Professor Williamson has spent the past twenty years in collecting the material upon which present results are based, and his is undoubtedly the most complete collection extant. These specimens, with the structure exquisitely preserved, come mostly from the districts around Oldham and Halifax, occurring in calcareous nodules imbedded in coal seams.

The results of a study of the histological elements in these specimens, briefly stated, are as follows: The medulla was composed exclusively of parenchymatous tissue, and early, by absorption or decay, became hollow. Into this fistular medullary cavity stigmarian or other rootlets penetrated, sometimes to the number of half a dozen, thus causing great complication. These specimens, to the casual observer, would appear to be traversed by fibro-vascular bundles, and by a study of such specimens several observers were led into error.

Surrounding the medulla was a vascular or xylem cylinder composed of transversely barred vessels or tracheïds. These tracheïds, arranged in bundles, did not preserve a longitudinally straight, but an undulating course through the stem, the undulating curves of one bundle being opposed to those of its neighbor on either side. "The result of the wavy undulations was that contiguous bundles alternately touched and separated from one another, inclosing, in the latter case, large, vertically elongated lenticular spaces, occupied by extensions of the medullary parenchyma which thus reached the bark. As the vascular cylinder grew exogenously each new superadded vessel followed exactly the undulating course of those upon which it rested."

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[4] WILLIAMSON, WILLIAM CRAWFORD.—A monograph on the morphology and histology of Stigmaria ficoides. (The Palæontographical Society, volume for 1886.) 62 pp., 15 plates. London, 1887.

The cortex consisted of three layers, which pass more or less gradually into each other. The outer is composed of parenchymatous cells, which are without special order of arrangement; the inner of a zone of cells arranged in radial parallel lines; while the middle is a transition with slight distinguishing characters, from the one to the other.

The origin of the root-bundles which run to the rootlets is as follows: Some of the vessels of the xylem cylinder, or usually, in the initial step, one vessel, instead of pursuing the undulating course, is deflected outward and forms the basis of one of these bundles. Other vessels are added to it from time to time, and it thus increases in diameter. Where these emerge from the bark a lenticular scar is produced, giving rise to the well-known stigmarian characters.

Without going further into a description of the histology, the conclusions of Professor Williamson may be summed up as follows: Stigmaria were *always* roots, and, moreover, were roots alike of Lepidodendra and Sigillariæ, which primeval Lycopodiaceæ were undoubtedly the remote ancestors of the modern Lycopodiaceæ. This view is strengthened by the analogy which is shown to exist between stigmarian roots and the roots of modern Lycopodiaceæ, particularly of Selaginella and Isoetes. The latter, like Stigmaria, has a fistular medullary cavity which is produced by the early absorption or non-development of the delicate parenchyma which ought to be present. The origin of the rootlets is also similar.

F. H. KNOWLTON.

Diseases of the grape.

Two important works on the diseases of the grape have recently appeared in France. A small work on the black-rot,[5] by MM. Viala and Ravaz, is a revised and somewhat enlarged edition of the treatise by the same authors which appeared a little over a year ago. A number of the figures in the present edition are new, and are especially clear illustrations of the botanical characters of the fungi they represent. The first sixty pages are devoted to the discussion of the black rot, with a comparative study of other forms of grape-rot which have not always been clearly distinguished from it. Considerable space is devoted to pointing out the distinctions between black rot and anthracnose, which "have been and are yet confounded with each other in publications."

The first illustrated description of anthracnose published in this country was that which appeared in Bulletin 2 of the botanical division of the United States Department of Agriculture, published last year under the direction of the commissioner of agriculture. In this publication the distinctive characters between the black rot and the rot of anthracnose were clearly pointed out. There has doubtless been some confusion in this country in the use of popular terms for these diseases; but the term "bird's-eye-rot" has been applied to anthracnose on the berry, and may well be generally adopted, as it is peculiarly descriptive and certainly would never be applied to any other variety of grape-rot.

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[5] VIALA, PIERRE, and RAVAZ, L.—Le Black Rot et le Coniotherium diplodiella. (Second edition.) 88 pp., 1 colored plate and 15 wood-cuts, small 8vo. Montpellier and Paris, 1888.

The work concludes with a bibliography of the subject, and although a number of American authors are cited the greater number of papers appear to have originated in France. Some important observations made by Prof. Viala while in this country the past summer are included in the book. F. L. S.

The second of the works referred to is a much larger volume;[6] a larger volume in fact than most persons would suppose could be written in a concise and well digested form on the diseases of the grape. The treatise is written from a practical stand-point, the author, Dr. Viala, being professor of viticulture in the National Agricultural School of Montpellier, France.

Half of the volume is devoted to the two mildews, one growing upon the surface (Oidium Tuckeri), and the other (Peronospora viticola) within the leaves and other parts of the host. There are forty-five pages on black rot (Physalospora Bidwellii), and as many on anthracnose (Sphaceloma ampelinum); while sixteen pages on melanose, a poorly recognized disease caused by Septoria ampelina, and the "American oidium," Uncinula spiralis, completes four-fifths of the volume. The remaining fifth of the volume enumerates 275 species of fungi which have been found growing upon the grape, with notes on a few of them, and gives brief descriptions of diseases not due to parasitic fungi. This long list of fungi is divisible into three categories, including 150 accidental, 100 saprophytic, and 25 parasitic species. It is the latter sort that more especially interest the cultivator and the economic botanist.

The half-dozen diseases which form the bulk of the volume are mostly of American origin, and all occur in the United States, unless it be the imperfectly known European oidium. The author's treatment is logical, concise and well-directed, and the illustrations ample and satisfactorily executed. It is to be hoped that before long similar works on the more important plant diseases will be written for this country.

An outline of the topics under black rot, although not the longest subject, will give an idea of the author's method. After a few words about the name, and a bibliography in which are the names of Andrew Fuller, Robert Buchanan, Bush and Meissner of Missouri, George Engelmann, Geo. Husmann, J. Strong, Wm. Trelease, J. B. Ellis, F. L. Scribner, and E. C. Bidwell, all American writers, a history of the disease in France and in America is given, followed by a description of the external characters by which it may be recognized. The part devoted to the botanical characters of the fungus shows the species to be very polymorphic. The indebtedness of the author to the studies of Prof. Scribner, of the United States Department of Agriculture (published in this journal for November, 1886, and elsewhere), is acknowledged, especially his indebtedness for the account and illustrations of the perithecia, which have, up to the present time, only been observed in this country. The subject is appropriately closed with full details of all effective means yet known for combating the disease.

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[6] VIALA, PIERRE.—Les Maladies de la Vigne; avec une étude des appareils de traitement par Paul Ferrouillat. (Second edition.) 462 pp., five colored plates and 200 wood-cuts, 8vo. Montpellier and Paris, 1887.

NOTES AND NEWS.

MISS SUSAN M. HALLOWELL, professor of botany at Wellesley College, is pursuing studies in the laboratory of Dr. Kny at Berlin.

DR. J. H. OYSTER, of Paola, Kansas, has published his new catalogue of North American plants. It contains 125 pages and an index of genera. The price is $1.25.

"TIMBER, and some of its diseases," is the subject of a series of illustrated papers by H. Marshall Ward in *Nature*, beginning with issue of December 22, 1887.

MARCUS E. JONES gives a very interesting description of the flora of Utah, in a four-page pamphlet, said to be a reprint from Tullidge's magazine, *The Western Galaxy*, for March, 1888.

THE VOLUME on British Discomycetes by William Phillips, F. L. S., which was announced more than two years ago, has recently appeared as a number in the International Science series.

EDWARD L. BERTHOUD, a well known botanist and engineer of Colorado, is making a botanical excursion into Lower California, not only along the coast, but into the interior, from which we expect some interesting results.

A SOCIETY for the promotion of the knowledge and cultivation of Cacti and other succulent plants has been established at Antwerp, under the title of "Vetplantenkring." Any one interested in the subject can address the secretary, Mr. T. Havermans, Rue Jésus, 46, Antwerp.

DR. ANTON DE BARY, Professor of Botany in the University of Strassburg, died, after a brief illness, on the 20th day of January, in the fifty-seventh year of his age. The GAZETTE will publish next month a sketch of his life and personal traits from the pen of a former pupil, Dr. F. B. Power, of the University of Wisconsin.

EDWARD S. BURGESS has published a little guide to the student in botany for his use in the Washington (D.C.) High School. It shows a commendable effort to pursue the study of botany in the right way, even in high schools, and probably pushes the subject as far as is consistent with the time and appliances at command.

DR. ALEXANDER DICKSON, Professor of Botany in Edinburgh University, died December 30, being seized with a sudden illness while on the ice, engaged in his favorite pastime of "curling." He was 51 years of age. A biographical sketch in *Nature* (January 5) says that by his death the world loses one of its best morphologists.